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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER
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ART UNIT	PAPER NUMBER
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DATE MAILED:
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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
**09/045,507**

Applicant(s)  
**Macintyre**

Examiner  
**Douglas Wille**

Group Art Unit  
**2814**



☒ Responsive to communication(s) filed on Feb 25, 1999

☒ This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 4, 6, 7, and 15-17 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 4, 6, 7, and 15-17 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All ☐ Some\* ☐ None ☐ of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

(Certified copies not received:

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit 2814

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1 Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

2 Claim 16 states that the holes in the glass sheet are tapered. While it is understood that it is difficult to form a perfectly uniform hole and some tapering will invariably occur, if this is a claimed feature some means must be provided to form the structure, unless Applicant wishes to claim an artifact of the formation process. Correction is required.

3 Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4 A tapered hole is claimed but there is no discussion of what the taper is. Is it tapered in, tapered out or is it hour glass shaped? What is the degree of taper? What is the angle of the side of the via, is it close to a right angle or is it at a 45 degree angle? Corrections required

### *Claim Rejections - 35 USC § 103*

Art Unit 2814

6        Claims 4, 6, 7 and 15 - 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Tsukamoto and Igarashi et al.

7        Lin shows a flip chip device (see Figure 5 and column 5, line 15) with a semiconductor chip 12 attached to an interposer board 22. Lin shows the interposer board attached to a PC board with layer of adhesive 36 but does not show a similar attachment between 12 and 22, noting that while it is standard practice (column 2, line 22) it prevents rework. Note that if rework is not as issue, bonding is recommended. Lin also teaches that the thermal coefficient of expansion of the interposer should match that of the die (column 6, line 28). Lin shows vias 24 in the plate 22 with evaporated traces 26 (column 6, line 64) on the plate which connects contacts 16 to vias 24 and solder beads 32 are formed on the surface of 22. Lin shows that the metallization 26 can be evaporated and if performed after forming the hole it will extend into the holes. In addition a conductive fill is used for the vias (column 6, line 66). Lin does not specify the material of the plate 2 but Tsukamoto shows a similar structure where the plate is a glass ceramic which will match the TCE of the die. Igarashi et al. show the use of polyimide to bond the die to the intermediate sheet. It would have been obvious to modify the device of Lin to include the glass ceramic plate taught by Tsukamoto to match the TCE of the die and plate and to use the polyimide bond taught by Igarashi et al. to have a known bonding material. With respect to claim 16, all techniques for forming holes in glass plates will produce some tapering, especially if a

Art Unit: 2814

*Response to Arguments*

8. Applicant's arguments filed 2/25/99 have been fully considered but they are not persuasive.

9. Applicant states that the obviousness of the combination of Lin and Sukamoto is not established. But to repeat the rejection, Lin teaches the desirability of matching the CTE and Tsukamoto shows a glass material that matches the TCE. Since both patents are known it is clearly obvious to combine them. Applicant states that the Examiner's opinion is irrelevant and meaningless. Does Applicant suggest that the examination be performed by someone other than the Examiner and if so, who? But until someone else is identified, it is the Examiner who forms conclusions about obviousness.

*Conclusions*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit 2814

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action

12 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

13 Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.



Olik Chaudhuri  
Supervisory Patent Examiner  
Art Unit 2814

DAW /s/

April 30, 1999